



## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: F. Ménard

Application No.: 09/154,431

Group Art Unit: 2663

Filed: September 16, 1998

Examiner: D. Duong

For: APPARATUS AND METHOD TO USE A CONVENTIONAL TELEPHONE SET  
TO MAKE TELEPHONE CALLS ON A PACKET NETWORK

### DECLARATION UNDER 37 C.F.R. § 1.131

Commissioner for Patents  
PO Box 1450  
Alexandria, Virginia 22313-1450

Sir:

I, François Ménard, hereby declare that:

1. I am the inventor of the invention disclosed and claimed in the above-identified patent application.
2. This declaration is filed to show that prior to June 4, 1997, I had conceived and reduced to practice the subject matter of the above-identified invention while employed by Mediatrix Peripherals, Inc., which is now known as Mediatrix Telecom, Inc. (Mediatrix).
3. Mediatrix initially concentrated its research and development on technology and products for the PC audio environment, and developed several sound boards. Mediatrix later designed daughterboards for its sound boards to allow voice transmission over an IP network. Mediatrix eventually developed new fully integrated combination boards that incorporated both a sound board and a DSP (digital signal processor) board for voice over IP. A companion board to this fully integrated combination board was also developed. This

companion board included two POTS (plain old telephone system) jacks as well as one PSTN (public switched telephone network) jack, allowing for the connection of two ordinary telephone handsets as well as an ordinary telephone line. This allowed for the use of the board as a gateway from the IP network to the PSTN environment, and also allowed for the intelligent routing of calls through IP or PSTN.

4. Attached hereto as Exhibit A is a copy of an order form for Technologies Lyre, Inc. (Lyre), through which Mediatrix subcontracted services. An English translation of the order form is also attached. The dates have been redacted in accordance with standard practice, but all are prior to June 4, 1997. Exhibit A evidences that the invention was conceived prior to June 4, 1997.

5. In addition to the PC products, Mediatrix also developed a design that incorporated all of the sound board and daughterboard technology into a small, stand alone box. This project was called the "Audiotrix CableNetPhone" project. A preliminary draft of this project was prepared and presented to CANARIE (Canada's Advanced Internet Development Organization). Relevant portions of the draft, with dates being redacted, are attached hereto as Exhibit B. Exhibit B evidences that the claimed subject matter was invented prior to June 4, 1997. Note that the draft references intelligent routing with respect to a CTI (computer telephony integration) application.

6. Mediatrix also entered into a partnership agreement with Cogeco Cable Canada Inc. (Cogeco) to provide voice communications capability to the Cogeco bi-directional HFC (hybrid fiber/coax) cable network. Attached hereto as Exhibit C is a shipping memorandum indicating that a computer, in which was installed an Audiotrix Phone Gateway that allowed the intelligent routing of all phone calls over the IP Network and over the PSTN, was

delivered to Cogeco. An English translation of the memorandum is also attached. Exhibit C, from which dates have been redacted, evidences that the claimed subject matter was invented prior to June 4, 1997.

7. Mediatrix displayed the Audiatrix Phone at a trade conference to demonstrate the integration of computer telephony with internet telephony. Attached hereto as Exhibit D is a redacted copy of a demonstration sheet used at the conference. Exhibit D illustrates the principal of intelligent routing within the Windows application, and evidences that the claimed subject matter was invented prior to June 4, 1997.

8. Attached hereto as Exhibit E is a redacted demonstration sheet from another trade show. Exhibit E evidences that the claimed subject matter was invented prior to June 4, 1997.

9. Attached hereto as Exhibit F is the relevant portion of an internal Mediatrix document describing an embodiment of the claimed invention. Exhibit F, from which dates have been redacted, evidences that the claimed subject matter was invented prior to June 4, 1997.

10. I have reviewed the documents of Exhibits A-F. Although the dates have been redacted, all dates are prior to June 4, 1997. I hereby confirm that the work evidenced by the documents of Exhibits A-F and all the acts relied upon in this declaration were carried out by me or someone acting at my direction prior to June 4, 1997.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully Submitted,

**Dated: September 8, 2003**

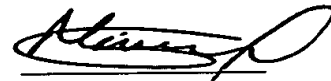
  
**François D. Ménard**

Exhibit A

**Technologies Lyre Inc.**

**Feuille de projet**

**Titre du projet:** AT Phone (ex-BTA 1)

**Code:** ATPh.1

**Numéro:** M.10

**Client:** Mediatrix

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**Chargé de projet:** C. Trudel

**Équipe de projet:** C. Trudel (Design, ASIC, mise en route), A. Noël (PCB), S. Thériault (mise en route, tests), F. Duchene (driver), M. Bergeron (code DSP)

**Cédule:**

**démarrage:**

**étapes: (pour version B)**

tests de version A:

pre-certif FCC:

schéma prêt:

pièces commandées:

Layout prêt:

proto prêt(5):

proto prêt(45):

homologation FCC, tests finaux:

1 ère production (500):

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**Description:**

Le projet Audiotrix Phone consiste à réaliser une carte sonore ISA de type multimédia augmentée d'un processeur permettant de compresser des données de voix à un débit de 8 ou 5.8 Kbit, et d'envoyer ces données sur Internet (voir les documents de spécification de la Audiotrix Phone/BTA1). Voir la spécification fonctionnelle de la Audiotrix Phone pour plus de détails.

La carte est basée sur le daughterboard DVC/Phone (qui utilise un TMS320C50) et sur le circuit OPL3-SA2. Elle utilise le code TMS du DVC/Phone (en conjonction avec l'application DVC/Phone de Mediatrix). Le développement de ces logiciels fait l'objet d'un autre projet (DVC/Soft).

Dans la phase actuelle, le projet consiste à la mise au point d'une version B, l'homologation FCC et CEMark de celle-ci et la mise en route d'une première production (500) pour

Mise à jour:

Technologies Lyre Inc.

Project Sheet

Title of project: AT Phone (ex-BTA 1)

Code: ATPh.1

Number: M.10

Client: Mediatrix

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Person in charge of project: C. Trudel

Project team: C. Trudel (Design, ASIC, startup), A. Noël (PCB), S. Thériault (startup, tests), F. Duchene (driver), M. Bergeron (code DSP)

Schedule:

beginning: [REDACTED]

steps (for version B)

tests of version A: [REDACTED]

pre-certif FCC: [REDACTED]

diagram ready: [REDACTED]

parts ordered: [REDACTED]

Layout ready: [REDACTED]

prototype ready (5): [REDACTED]

prototype ready (45): [REDACTED]

homologation FCC, final tests: [REDACTED]

first production (500): [REDACTED]

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Description:

The project Audiotrix Phone consists of realizing a sound card ISA of multimedia type, increased by a processor that allows voice data to a flow of 8 or 5.8 Kbit, and to send this data on the Internet (see specifying documents of the Audiotrix Phone/BTA1). See the functional specification of the Audiotrix Phone for more details.

The card is based on the daughterboard DVC/Phone (that uses a TMS320C50) and on the circuit OPL3-SA2. The card uses the code TMS of DVC/Phone (in conjunction with the application DVC/Phone of Mediatrix). The development of these softwares are the object of another project (DVC/Soft).

In the actual phase, the project consists of the development of a version B, the homologation FCC and CEMark of this one and the startup of a first production (500) for [REDACTED].

Updated: [REDACTED]

Exhibit B



**CONFIDENTIAL**

# **Audiotrix<sup>®</sup> CableNetPhone**

**The first telephone designed for the Information Super-Highway**

**by Mediatrix Peripherals Inc. with**

**Cogeco Cable Canada Inc. and**

**Rogers Communications Inc.**

**Presented to CANARIE**

## EXECUTIVE SUMMARY

### The Company

Mediatix Peripherals Inc. is an established industry leader in the design, development and marketing of audio products for the personal computer. In the [REDACTED] Mediatix introduced the Audiotrix<sup>®</sup> Pro DVC/Phone. The DVC/Phone (Digital Voice Compressor/Phone) is a daughterboard for the Audiotrix<sup>®</sup> Pro sound board permitting full duplex conversations across computer networks, including LANs, WANs, and the Internet. Mediatix was the first company in the world to reach the personal computer market with a hardware-based solution for high-quality, low bit-rate, network audio communications.

### The Project

The Audiotrix<sup>®</sup> CableNetPhone project consists of developing the world's first ITU H.323<sup>1</sup>-compliant audio terminal designed to operate without the requirement of a personal computer. [REDACTED]

The Audiotrix<sup>®</sup> CableNetPhone will convert H.323-compliant Internet Telephony interactive audio communication data received from the network to an analog audio signal suitable to be played through the ear piece of a telephone handset. Similarly, the device will also digitize, compress and convert the audio signal received from the microphone of the handset into H.323-compliant format, and send it onto the network. Both processes will be performed simultaneously in full-duplex operation.

The circuitry of the Audiotrix<sup>®</sup> CableNetPhone will be mainly comprised of a microcontroller, a powerful digital signal processor, flash-ROM, an RS-232 serial TTY port, an IEEE 802.2 Ethernet interface, 2 RJ11 interfaces: one for a 2500-type telephone and the other for connecting to a conventional telephone line. All of the microcircuitry will be controlled by a proprietary ASIC from Mediatix.

Most of the work developing the Audiotrix<sup>®</sup> CableNetPhone will be concentrated on the writing of thousands of lines of embedded software code. Because of the importance of this software project, Mediatix has given a name to this eventual intellectual property: ITOS, the Audiotrix<sup>®</sup> CableNetPhone Internet Telephony Operating System.

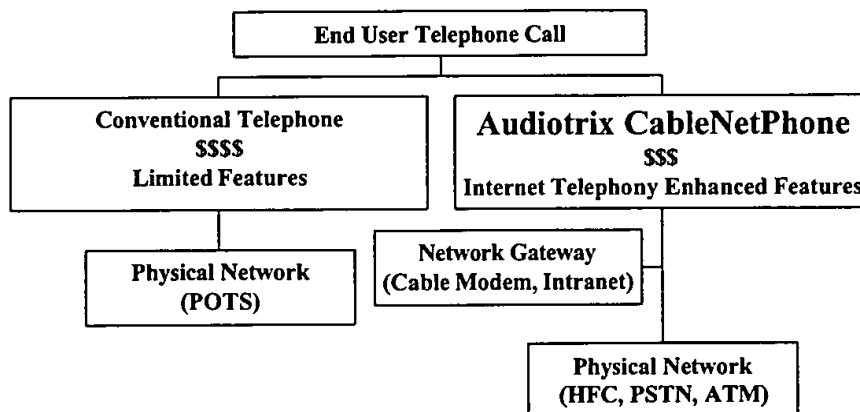
<sup>1</sup> H.323 is an International Telecommunications Union (formerly known as the CCITT) recommendation for packet video-telephony over networks deprived of Quality of Service. [REDACTED]



## THE PROJECT

### Description

The Audiotrix® CableNetPhone project will result in the development of the world's first ITU H.323-compliant audio terminal designed to operate without a personal computer. The Audiotrix® CableNetPhone will be the first device that will permit the connection of conventional telephones to data networks capable of "Internet Telephony" services.



### The Product and its Technologies

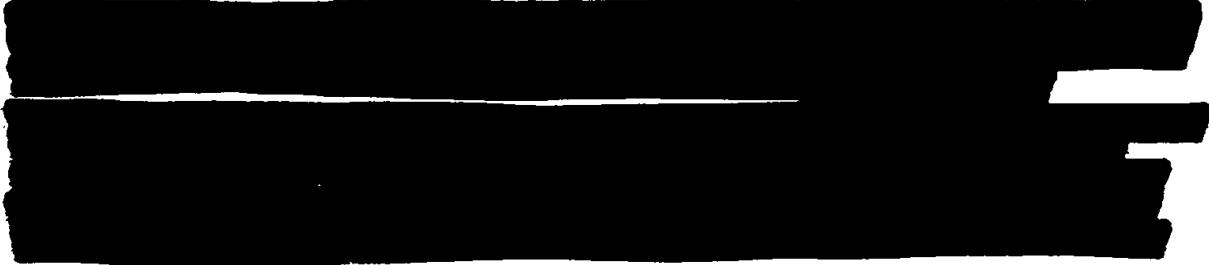
The Audiotrix® CableNetPhone will reside in a small box connected to the Ethernet network port of the network gateway on one side (the Intranet in the wall, the Cable Modem, etc.) and connected to a conventional telephone device (2500-type set) on the other side.

The Audiotrix® CableNetPhone will convert H.323-compliant Internet Telephony interactive audio communication data received from the network to an analog audio signal suitable to be played through the ear piece of the telephone handset. Similarly, the device will also digitize, compress and convert the audio signal received from the microphone of the handset into H.323-compliant format, and send it onto the network.

The circuitry of the Audiotrix® CableNetPhone will be mainly comprised of a microcontroller, a powerful digital signal processor, flash-ROM, an RS-232 serial TTY port, an IEEE 802.2 Ethernet interface, 2 RJ11 interfaces: one for a 2500-type telephone (with support for ring generation) and the other for connecting to a conventional telephone line that would be used in Computer Telephony Integration (CTI) applications and Internet Telephony - POTS Gateway applications.

The Mediatrix Internet Telephony Operating System (ITOS) will combine all software and firmware required to run the Audiotrix® CableNetPhone. ITOS version 1.0 will ship with the first commercial release of the Audiotrix® CableNetPhone. ITOS version 1.0 will include: the Internet Telephony-specific portion of the ITU H.323 protocol stack (H.225, H.245, G.711, G.723.1, G.729), an IP Stack with basic support for UDP and TCP, versions of the RTP, CRTP, RTCP, RTP Redundant Payload, RTP Forward Error Correction and RSVP Internet Protocols<sup>2</sup> as well as a User Interface for a Touch Tone telephone.

Through the use of the G.729 voice compression algorithm, the audio of the Audiotrix® CableNetPhone will be of the same high quality as that found on the Audiotrix® Phone. A cable environment, however, with 500 Kbps of throughput, allows the possibility of trading a few more bits/sec for greater reliability and even better quality.



<sup>2</sup> The aforementioned protocols are standardized by the Internet Engineering Task Force (IETF). The International Telecommunications Union (ITU) accepted to integrate these protocols as-is in the H.323 recommendation. This is seen as the first step towards the acceptance of Internet standards as ITU standards.

Exhibit C

# Mémo de livraison

Feuille 1  
de 1

## Expédié à :

### Lyre Inc.

5055, Boul. Hamel Ouest

Local 220

Québec, Québec

Canada

G2E 2G6

Tel: (418) 877-4644

Fax: (418) 877-7710

### Expéditeur

Stéphane Thériault

John Moran

### MediaTrix

455, rue King Ouest, Bureau 610

Sherbrooke

Québec

Canada

J1H 6E9

Tél: (819) 563-6722

M/I/A	Numéro d'expédition	Transporteur	Frais (coûts)	Colis
				1

Boîte	Quantité	Description
1	1	AT Phone Centoway (PH/AS) (+ PSTN eB #3)  PROTOTYPE installée et configurée dans ordinateur de Logeco.  WB

# Shipping Memo

page 1  
of 1

## Shipped to:

Lyre Inc.  
5055, Boul. Hamel Ouest  
Local 220  
Québec, Québec  
Canada  
G2E 2G6

John Moran  
MediaTrix  
455, rue King Ouest, Bureau 610

Sherbrooke  
Québec J1H 6E9  
Canada

Tel: (418) 877-4644  
Fax: (418) 877-7710

Shipper  
Stéphane Thériault

Tél: (819) 563-6722

M/D/Y	Shipping number	Conveyor	Cost	Packages
	-	-		1

Box	Quantity	Description
1	1	<p>AT Phone Gateway (PH/A5) (+ PSTN @ B #3)</p> <p>PROTOTYPE installed and configured in the computer of Cogeco</p> <p>AuB</p>

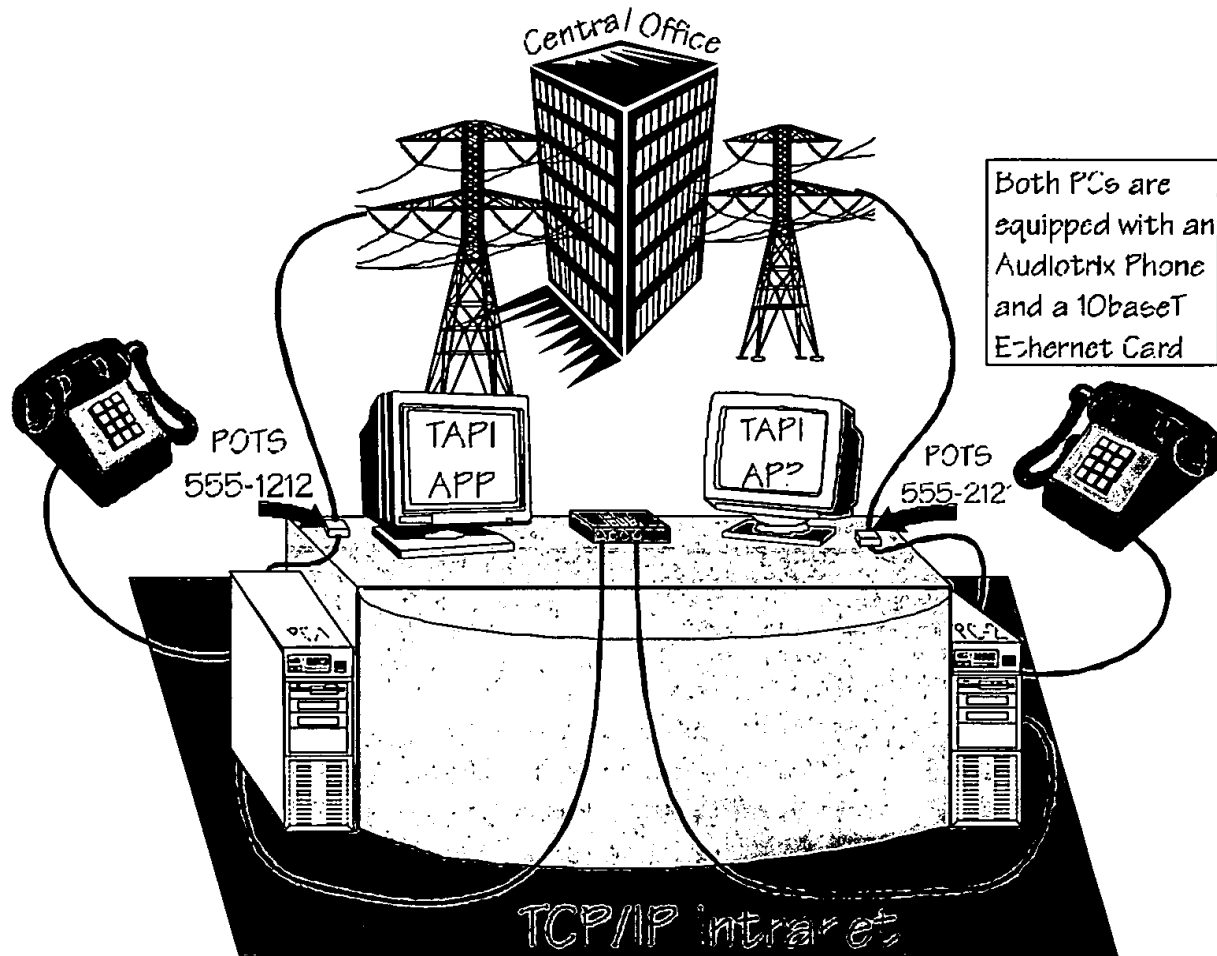
Exhibit D



# AUDIOTRIX<sup>®</sup> PHONE

NETWORLD + INTEROP Booth 3859

The first TAPI Service Provider for Internet Telephony



## Demonstration

1. Telephone 555-1212 calls Telephone 555-2121 over conventional phone lines.
2. Conversation occurs.
3. PC-1 opens Microsoft Outlook (TAPI).
4. PC-1 calls PC-2 over the LAN (Intranet or Internet). PC-2 is running Microsoft Phone (TAPI).
5. When IP connection is made, 555-1212 and 555-2121 hang up conventional phone line and continue talking over the Intranet.

## Features

1. First CTI adapter to meet the ISA **Plug'n'Play v1.0a** specifications for easy installation
2. First CTI adapter especially designed to offer the **highest quality Internet Telephony functionality**
3. First CTI adapter to come with an **Internet Telephony TAPI Service Provider (ITSPI)**
4. Most affordable client CTI adapter with **Internet Telephony to POTS gateway** capability
5. First CTI adapter designed as a **full-featured sound card**
6. **Powerful TAPI integration** between the application and the telephone at the desktop

## Benefits

1. **Plug'n'Play.** To date, few CTI cards have been designed for usage in a client workstation and even fewer have been designed with Plug'n'Play installation. The end-user will appreciate the ease of installation that Plug'n'Play brings: an individual on an Intranet, a person telecommuting to work, a call-center agent on an Intranet, a telecommuting call-center agent, and the CTI VAR occasionally frustrated by IRQ problems.
2. **Highest quality Internet Telephony functionality.** The use of a dedicated Digital Signal Processor (Texas Instrument TMS320C50 DSP) is responsible for many benefits. The DSP ensures low host CPU usage during utilization, even with a complex ACELP toll quality compression algorithm. The DSP provides for hardware-assisted real-time speech compression, which results in much lower encoding latency than software compression (even with MMX). Furthermore, since the compression is done on the card, ISA BUS transfers pass along already compressed audio. Use of a DSP for Internet Telephony ensures toll quality telephone communications that surpass the ITU G.114 specification for human-perceptible delays in a conversation (not factoring in uncontrollable IP network problems).
3. **Internet Telephony TAPI Service Provider (ITSPI).** The complexity of Internet Telephony has been abstracted to the Voice Bearer mode of a TAPI Service Provider. This allows hundreds of existing TAPI 1.4 and 2.0 applications to be moved to the Intranet. With the use of the Audiotrix® Phone Internet Telephony TAPI Service Provider, any TAPI application ( ) can place calls across any IP network such as the Internet. With the Audiotrix® Phone ITSPI, placing an Internet Telephony call through TAPI is as simple as replacing the phone number in the TAPI dialing string with either an IP address, a DNS name or a Directory Service lookup query.
4. **Internet Telephony to POTS gateway.** The race is on to bring first to the market the most powerful Internet Telephony to PSTN gateway (BRI, PRI, T1, Multiple T1, T3, ATM?). The Audiotrix® Phone can be used to implement a lower-cost, integrated system of massively distributed Internet Telephony to POTS single-line gateways over an Intranet or over the Internet (through RPC/DCOM, Java/Tel/RMI or Corba).
5. **Full-featured sound card.** The Audiotrix® Phone is the first CTI adapter to deliver full-featured sound card functionality. This is an absolute requirement in a client workstation where an end-user does not want to have to install both a sound card and a CTI board. The Audiotrix® Phone extensive soundcard functionality surpasses all Microsoft requirements and includes: 16-bit full duplex 48KHz high-fidelity digital audio, Sound Blaster PRO / MPU-401 / Windows Sound System hardware compatibility, software Wave Table Synthesis, optional MIDI/Joystick cable & upgradability to Yamaha XG hardware Wave Table Synthesis.
6. **Powerful TAPI integration.** "TAPI integration at the desktop" gives birth to a new paradigm in CTI: Client/Server CTI. Intelligence in the client allows for new applications that would benefit from PBX-like functionality "in the telephone". One of the more interesting benefits is the ability for end-users to program their own telephones. This would permit more complex call transfers schemes, customized personal voice mailbox trees and powerful unified messaging delivery options.

Exhibit E

# **AUDIOTRIX<sup>®</sup> PHONE**

**NETWORLD + INTEROP  Booth 3859**

## **POTS Interfaces**

### **Single Line/Handset**

- Does not take another internal PC slot
- 2 RJ45 connectors (1 for a line and one for the handset)
- On Hook / Off Hook detection
- Robust line protection
- Applications: Single line IT to POTS gateway, voice mail, client CTI (call center agents, integration of telephone sets in Intranet applications, etc.), integration of Internet Telephony in a POTS V.3x modem pool environment, Voice over IP to Voice over Frame Relay transcoding bridge, POTS link as a backup for Internet Telephony, etc.

### **Dual Line + Handset with or without Ring Generation on Handset**

- Does not take another internal PC slot
- 3 RJ45 connectors (2 for lines and one for handset)
- On Hook / Off Hook detection
- Ring Detection on the line interface
- Ring Generation with overload protection on the local telephone handset connector
- Robust line protection
- Applications: Dual line IT to POTS gateway, voice mail, client/server CTI (call center agents, integration of telephone sets in Intranet applications, basic ACD, etc.), PABX, call conferencing, integration of Internet Telephony in a POTS V.3x modem pool environment, Voice over IP to Voice over Frame Relay transcoding bridge, POTS link as a backup for Internet Telephony, etc.

### **Expansion capability for future analog/digital interfaces**

- Caller ID support
- Digital PABX / KSU Telephone Sets support
- CTI Busses support: MVIP, SCSA, etc.
- Multiple telephone sets
- Documented Digital (or Analog) Telephony Upgrade Interface hardware connector
- Home Automation

### **TAPI support through TAPI Service Providers**

- POTS Interface TAPI Service Provider
- Internet Telephony TAPI Service Provider

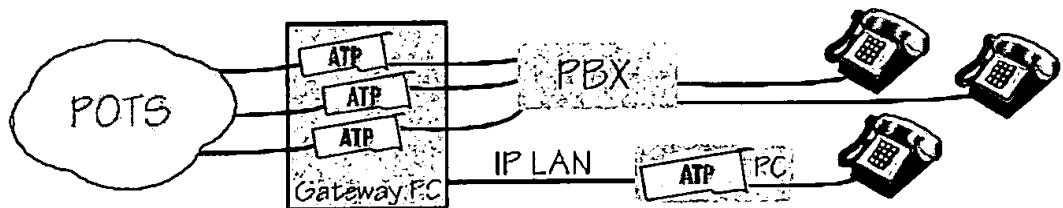
# AUDIOTRIX<sup>®</sup> PHONE

NETWORLD + INTEROP  Booth 3859

## Voice over IP to POTS Gateways

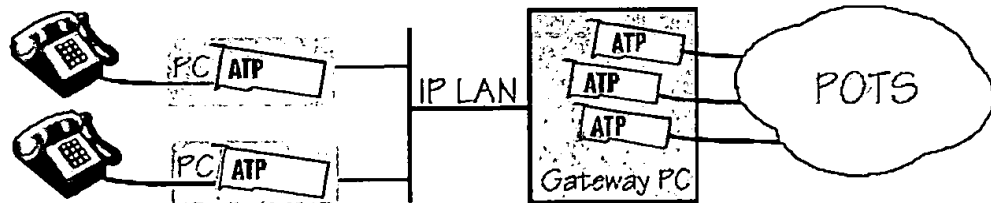
### Inbound Gateway

An Inbound gateway is used for routing calls arriving from the POTS (Plain Old Telephone Service) network to either an Audiotrix<sup>®</sup> Phone in a client PC or to an Audiotrix<sup>®</sup> Phone in a LAN-centric Server PC connected to a KSU (Key System Unit) or PBX. The gateway PC would also be performing some ACD (Automatic Call Distribution) functionality, which makes the Inbound Gateways very suitable for call center applications where agents cannot install Audiotrix Phones into all of their PC's.



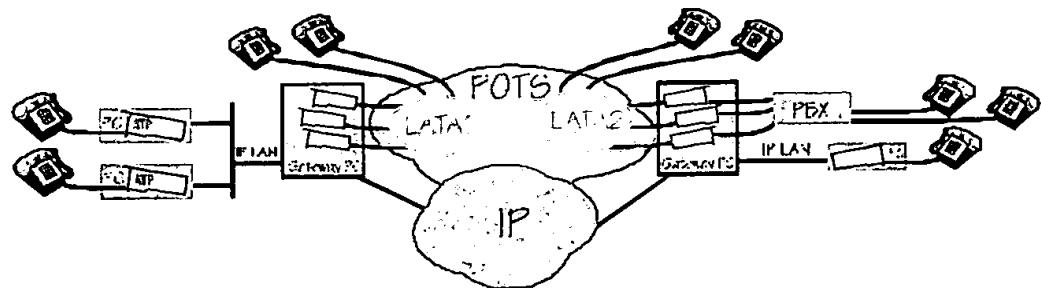
### Outbound Gateway

An Outbound gateway is used to provide POTS resources to calls incoming from an Audiotrix<sup>®</sup> Phone on the corporate intranet/extranet. In this scenario, Audiotrix<sup>®</sup> Phones are installed in server PC's and arranged in a manner that resembles a conventional outbound modem pool.



### "Hop-on Hop-off" Gateway

A "Hop-on Hop-off" gateway is a gateway used to provide a dialtone over the Internet to make calls that otherwise would be charged as long-distance. The calls "Hop-On" the IP cloud, then cross the long-distance area over the Internet and "Hop-Off" back to the conventional POTS network. Currently, this is the most widely known application for Voice over IP to POTS gateways. Such gateways can be used by corporations and by public carriers to implement a lower cost alternative to conventional IXC (Inter-Exchange Carrier) services. In this scenario, Audiotrix Phones are installed into server PC's located at the premises of the Internet Service Provider on both sides of the IP cloud that encompasses the long-distance area.



## Features

1. Low cost per port
2. Scalable
3. Unsurpassed sound quality
4. Ease of installation and hardware maintenance
5. High-availability
6. Ease of developing custom applications
7. Availability of Gateway software applications from Mediatrix
8. POTS interfaces expandability

## Benefits

1. Using widely available components, the Audiotrix Phone offers an unmatched **low cost of less than \$750** per port including DSP-based voice compression.
2. Currently, 4 Audiotrix Phones can be installed into a PC with 1 line per Audiotrix Phone for a total of 4 lines per PC. In addition, the Audiotrix Phone has been designed to support 2 lines per card and a DSP software upgrade will be available soon offering this dual line support. In this manner, 4 Audiotrix Phones in a PC will be able to support 8 individual phone lines. This **scalable** feature assures the user that the hardware will grow with his needs. In the future, more lines could be added because of the unique ability of the Audiotrix Phone to share Interrupt Lines. If there is a demand, Mediatrix will offer an industrial PC ISA back plane with the possibility of handling up to 12 Audiotrix Phones per PC.
3. The Audiotrix Phone is one of the few CTI cards to use 16-bit Sigma-Delta 64x oversampling codecs. Furthermore, the use of a powerful dedicated DSP for voice compression allows the use of real-time implementation of higher-quality compression algorithms. These algorithms are difficult to implement in software and practically impossible to run in real-time at RING3 on a PC (ex. full G.729 in DSP versus G.729a in software running at RING3). The combined use of high-fidelity codecs, DSP-based algorithms and high-quality SLICS ensures **unsurpassed sound quality** for all applications, whether POTS voice-based or Internet Telephony based.
4. The Audiotrix Phone fully complies with the **ISA Plug'n'Play 1.0A specification** guaranteeing **ease of installation**. In fact, Plug'n'Play assures the easy configuration of not only one Audiotrix Phone per PC, but many Audiotrix Phone's per PC. And there is never any need to move a jumper.
5. By supporting not only Windows NT as a gateway server, but also by developing versions of gateway software for use under UNIX (such as Linux or FreeBSD), Mediatrix will ensure that the deployment of gateways using very low cost "headless" "NetPC's" (which make reliable redundant clusters affordable) becomes possible.
6. Using well-known API's available in the area of CTI such as TAPI ensures an **ease of developing custom applications** for the Audiotrix Phone platform
7. Mediatrix will be supplying **world-class gateway software** that will exploit all of the functionality of the Audiotrix Phone.
8. The Audiotrix Phone currently supports the Audiotrix Phone Single-POTS interface, the Audiotrix Phone Dual-POTS interface and Audiotrix Phone Dual-POTS interface with ring generation. Mediatrix is also planning to develop **other POTS interfaces for popular digital KSU's and PBX's**.

Exhibit F

## Technical Product Descriptions

### **APA-I: Audiotrix Phone Adapter I**

#### **Overview:**

Repackaging of our Audiotrix Phone CTI Board in a low-cost Embedded PC

#### **Description:**

In this first version, the Audiotrix Phone Adapter is a simple repackaging of the Audiotrix Phone CTI board in an embedded PC. The objective behind this product was to quickly reach the market with a product that has the functionality of an Internet Telephony Appliance. Further, in this configuration, the hardware is very flexible and especially suited for adding experimentation software (such as network latency report generation, end-user feedback studies, etc.). The embedded PC allows us to run just about any Operating System including Windows 95 if required. The APA-I can be upgraded via software to the functionality of the new APA-II. Finally, the APA-I is currently being used by the Massachusetts Institute of Technology Internet Telephony Consortium as part of the end-user feedback studies experimentation's of the research program.

#### **Advanced Technical Specifications:**

- 80486 Embedded PC with 4 megs of RAM and 1.5 megs of flash ROM and onboard NE2000 Ethernet NIC.
- Mediatrix Audiotrix Phone v1.0 CTI Board for IP Telephony (1)
- Mediatrix Audiotrix Phone v1.0 POTS Interface for Audiotrix Phone v1.0 (2)
- Audiotrix Phone Adapter Embedded Software on flash memory

#### **1. Specifications of the Mediatrix Audiotrix Phone v1.0 CTI Board for IP Telephony**

- Yamaha OPL3-SA3 Plug'n'Play Single Chip Audio
- Texas Instruments TMS320C50 DSP
- Analog Devices 1847 secondary codec dedicated to CTI functions
- ACELP 3.0 with DTMF support codec running in DSP
- 2-channel of voice
- Expansion connectors for analog and digital PSTN interfaces

#### **2. Mediatrix Audiotrix Phone v1.0 POTS Interface for Audiotrix Phone v1.0**

- 2 RJ11 POTS Line Interfaces
- 1 RJ11 2500-Telephone Interface
- Telephone Line Interface: PSTN loopstart supervision, ring detection, caller id, call progress
- Telephone Interface: full featured functionality of 2500 hand-set interface, supports on-hook, off-hook, DTMF, ring generation, fax